Topic 4 – Bernoulli and Binomial Distributions
Self Evaluation
Quiz

1. According to a recent poll, 41% of US citizens approve of the job President Bush is doing. Assume that this proportion is actually true for the whole of the US population.

   (a) Suppose a simple random sample of 10 citizens is selected. What is the probability that a majority (more than 5) approve of the job that President Bush is doing?

   (b) Suppose a simple random sample of 50 citizens is selected. What is the probability that a majority (more than 25) approve of the job that President Bush is doing?

2. The probability that a person suffering from a migraine headache will obtain relief from a particular drug is 0.9. Three randomly selected sufferers from migraine headache are given the drug. Find the probability that the number obtaining relief will be 2 or 3.

3. A home security system has a 80% reliability rate, meaning that it goes off 80% of the time when there is a burglary. Suppose that 12 homes equipped with this system experience an attempted burglary. What is the probability that more than 7 alarms go off?

4. *(Source: Virtual Lab)* The common form of hemophilia is due to a defect on the X chromosome (one of the two chromosomes that determine gender). We will let "h" denote the defective gene, linked to hemophilia, and H the corresponding normal gene. Women have two X chromosomes, and "h" is recessive. Thus, a woman with gene type HH is normal, a woman with gene type "hH" or "Hh" is free of disease but is a carrier; and a woman with gene type "hh" has the disease. A man has only one X chromosome (the other sex chromosome, the Y chromosome, plays no role in the disease. A man with gene type h has hemophilia and a man with gene type H is healthy. *This is harder. Don't worry. Just try.*

   (a) Suppose that a mother is a carrier and the father is healthy. They have a son. What is the probability that the son will have hemophilia? Will be healthy?

   (b) Suppose that a mother is a carrier and the father has hemophilia. They have a daughter. What is the probability that the daughter will have hemophilia? Will be a carrier?